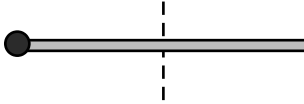


Moment of Inertia

Note: Feel free to use the chart on the back of the cover page to find moments of inertia.

1. What is the moment of inertia for the rod and mass shown in the diagram. The rod has a mass of 2 kg and a length of 0.5 meters while the little mass on the end of the rod is 0.5 kg. The axis is the center of the rod.

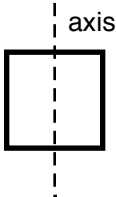


2. What is the moment of inertia for a thin rod (mass M and length L) that is rotated about an axis that is $1/3$ of the way from its end? (*There are 3 different ways to do this!*)

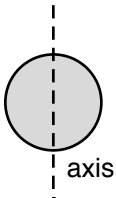
3. Imagine a rod and a disk have the same mass and both are being rotated about their center of mass. If the rod has a length of L , what should the radius of the disk be so that they have the same moment of inertia?

4. The rotational inertia of a given rod about some axis (perpendicular to the rod) is I . What would happen to the moment of inertia of the rod if
- the mass were doubled (but the length stayed the same)?
 - the length were doubled (but the mass stayed the same)?

5. Four thin rods are formed into a square. Each rod has a mass of 5 kg and a length of 80 cm. What is its moment of inertia about an axis through its center (as shown)?



6. What is the moment of inertia for a disc of mass M and radius R about its diameter?



Answers: 1) 0.0729 kg m^2 2) $1/9 ML^2$ 3) $\sqrt{\frac{1}{6}}L$ 4. a) $\times 2$ b) $\times 4$ 5) 2.13 kg m^2 6) $1/4 MR^2$